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VOLUME 1

FIELDCRAFT
(ENGLISH)

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FOREWORD

1. B-GL-392-009/FP-000, *Military Training, Volume 1, Fieldcraft* is issued on the authority of the Chief of the Land Staff.

2. This publication is effective upon receipt and supersedes B-GL-318-001/PT-001, *Military Training, Volume 1, Fieldcraft* of 01 May 1990.

3. Comments and suggestions for changes should be forwarded through normal channels to the CTC Infantry School, attention Chief Standards Officer.

4. Unless otherwise noted, masculine pronouns contained herein apply to both genders.

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CHAPTER 1
INTRODUCTION

SECTION 1
GENERAL

DEFINITION

1. Fieldcraft is made up of the individual skills and techniques used by soldiers in the field, which include movement, use of ground and camouflage in conditions of reduced visibility. These skills and techniques enable soldiers to maintain their own security while gaining advantage over the enemy.

SCOPE

2. Soldiers must master fieldcraft in order to ensure their own and their section's survival on the modern battlefield. They must:

a. use their eyes and ears to find the enemy, without being detected themselves;

b. make the best use of ground and cover, by day and night;

c. judge distances accurately;

d. recognize and indicate targets, understand fire discipline and follow fire control orders; and

e. move silently, with or without weapons, stores or equipment.

TRAINING

3. Fieldcraft training is complimentary to weapons training. A soldier should be trained concurrently in marksmanship and fieldcraft.

4. Fieldcraft training emphasizes the basics even when used to teach or demonstrate more advanced lessons. For example, personnel practising individual movement should be properly camouflaged. Soldiers must be taught that fieldcraft is a 24-hour-a-day concern.

CHAPTER 2
FINDING THE ENEMY

SECTION 1
DETECTION

WHY THINGS ARE SEEN

1. The ability to observe effectively is an acquired skill. Things are seen because they contrast with their surroundings in one way or another. There are 11 reasons why things are seen:

a. shape;

b. shadow;

c. silhouette;

d. movement;

e. spacing;

f. position;

g. texture;

h. colour;

i. scale;

j. noise; and

k. shine.

SHAPE

2. Experience teaches one to associate an object with its shape or outline. At a distance, the outline of an object can be recognized long before the details that make it up can be determined.

SHADOW

3. Against a dark background, the light surfaces of an object will be distinguishable, while against a light background, the dark or shadowed sides will show.

4. In addition, an object may cast a shadow beside it that may be visible even though the object itself may be out of sight. Objects in a shadow may be missed because the eye tends to accept conspicuously dark or light areas as uniform and does not seek out minor differences in darkness or lightness within them.

SILHOUETTE

5. Anything silhouetted against a contrasting background is conspicuous. Any smooth, flat background, like water, a field or (most frequently) the sky, will provide such a contrast. Any object may be silhouetted simply by being seen against a background of a different colour. Choose clothing and camouflage to match the background, if possible.

MOVEMENT

6. Although movement by itself seldom reveals the identity of an object, it is the most important factor for revealing existence. Even though the other recognition factors may have been completely eliminated, an enemy observer will be attracted to an area if movement is not controlled. An enemy observer may be concentrating on one area, but he will not fail to detect movement in another area through peripheral vision. Do not move unless absolutely necessary and then only to the extent necessary.

SPACING

7. In nature, things are seldom regularly spaced. Regular spacing, therefore, usually indicates man-made objects and attracts the eye of the observer. Be conscious of spacing when parking vehicles or laying out trenches.

POSITION

8. An object is often identified by its position in relation to its surroundings. A long object on a railroad track is assumed to be a train; similar objects on a river and parallel to its banks are assumed to be boats or barges. A large structure in a group of frame buildings might be a barn. Position is nothing more than the relationship in space of one object to another object or objects.

TEXTURE

9. Texture may be defined as the relative smoothness or roughness of a surface. A rough surface, such as a field of grass, reflects little light and casts many shadows on itself. It appears very dark to the eye or on a photograph. A smooth surface, such as an airstrip or the roof of a building, reflects more light in an aerial photograph.

COLOUR

10. Colour is an aid to an observer when there is contrast between the colour of an object and its background. The greater the colour contrast, the more visible the object. While colour alone will not usually identify an object, it is often an aid in locating an object or confirming a tentative identification. A secondary consideration is the tone of a colour. Usually, the darker shades of a given colour will be less likely to attract an observer's attention than the lighter, more brilliant shades.

SCALE

11. Objects that differ greatly in size from those around them will be more readily distinguishable than objects amongst others of approximately the same size.

NOISE

12. Sudden noises contrast with the normal quiet of the battlefield. Loud noises such as the firing of artillery weapons or the running of generators can pinpoint locations. During the Korean Conflict, sound ranging equipment provided the initial location of 80 percent of enemy indirect fire weapons.

SHINE

13. Flashes of light reflected off uncamouflaged materials such as glass and metal quickly attract the attention of ground and air observers.

SECTION 2
SEARCHING GROUND

NORMAL METHOD

14. The usual method of scanning is to divide the ground into foreground, middle distance and distance. One scans from the right to the left. Where the ground is fairly open this is the best method. When scanning is done horizontally, it is not necessary to continually alter the sense of scale (see Figure 2-1).

CLOSE COUNTRY

15. In close or broken country, different types of ground require different treatment. First, carefully examine areas likely to contain enemy positions, either because of their tactical value, slope and relation to crests or because of the possibility of good cover. Then, look along the junctions between such areas and other areas. Next, examine all areas visible through any screen, trees or foliage. Then, examine all remaining areas of light or sunlit ground. Finally, examine all areas of dark or shadowed ground. The sequence adopted depends on the terrain and range of observation.

MINIMAL LIGHT CONDITIONS

16. At dusk or in half moonlight or starlight, naked eye scanning is slower than in full light. The observer pauses for a few seconds looking in one direction, paying attention to objects off the direct line of vision. Then he shifts his line of vision by about 110 to 170 mils (approximately a fist's width at arm's length) and again pauses until objects become visible near his line of vision. He rests his eyes for 10 seconds every minute or two. With binoculars, a similar "move and stop" method is used, with attention paid to objects visible "out of the corner of the eye".

SEEING THROUGH

17. When attempting to see through a nearby screen, foliage, etc., the observer looks at the area under observation and ignores the screen. A small head movement automatically extends the area to be observed.

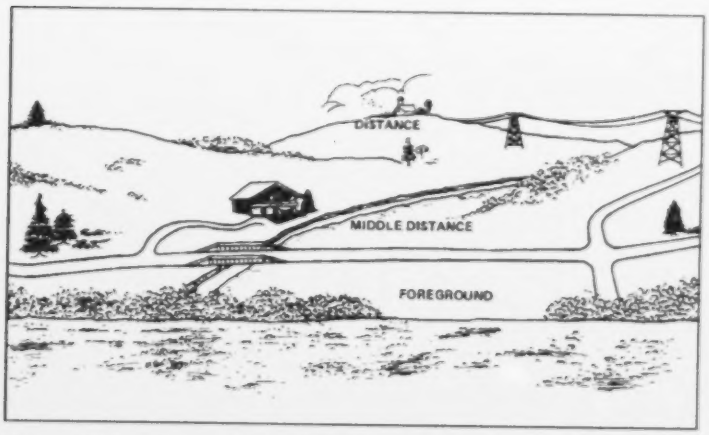

Figure 2-1: Foreground, Middle Distance and Distance

VISUAL INFERENCE

18. Even when seemingly insignificant portions of an object are visible, the identity of the complete object can be inferred. It is possible to determine that a person or a piece of equipment is present from the fact that small parts are in their correct relative positions.

OFF THE LINE OF VISION

19. Incidents rarely occur at the exact spot at which the observer is looking. The highly trained observer is said to have "eyes in the back of his head." This ability to note incidents off the line of vision can be developed by practice.

PERSONAL FACTORS

20. A good observer does not depend on eyesight alone to carry out the task efficiently. Given reasonable sight, any member can learn to become a good observer.

a. **Interest**. All observation is selective. In order to become good observers, soldiers must know what they should be interested in and what they should look for. Interest may be stimulated by knowledge. Interest, knowledge and observation are closely related. Soldiers begin by learning about the equipment and methods of their own army before becoming familiar with those of the enemy;

b. **Under and Over Expectation**. Soldiers learn to recognize when their judgement can be trusted. In routine observation, the soldier rarely starts fully alert. When there are long periods without incident, the observer is lulled into a false sense of security or may become bored. Conversely, if observers are nervous or over- excited, they may imagine the things they are expecting to see; and

c. **Comfort**. A soldier in a cramped or awkward position does not observe as efficiently as one who

can see with ease and comfort. The importance of ease of observation should be continually borne in mind when selecting an observation post, although other considerations such as concealment and protection also affect the choice.

21. **Use of Binoculars**. When using binoculars in open country, the sector should be covered systematically and the eye examines the whole of each field of view, both horizontally and vertically.

22. In close country where the naked eye alone is inadequate, binoculars are used to examine suspicious objects, areas of good cover, hedges, ground seen through trees and distant areas.

SECTION 3
NOISE AND MUZZLE FLASH

FLASH TO BANG

23. Since sound travels through the air at a fairly constant speed (330 metres per second), it is possible to estimate the distance from a weapon that has been fired if the travelling time of the sound from the weapon is known. The travelling time is the period between observation of a muzzle flash, backblast, smoke or dust raised by the concussion and hearing the round being fired. The time can be measured accurately by counting at a rate of three beats per second during the period. Counting starts as soon as the visual effects of the weapon firing are observed and cease when the report of the weapon is heard. The number reached will be the approximate distance to the weapon in hundreds of metres. If the count of eight has been reached when the report is heard, the distance to the weapon is approximately 800 metres.

CRACK AND THUMP

24. When a bullet passes near, one hears two noises: first, the crack of the bullet passing, then the thump of the weapon being fired. The crack is heard before the thump because the bullet travels faster than sound. The thump indicates the direction of the weapon. The distance to the weapon can be estimated by timing the interval

between the crack and the thump. The further away the weapon, the longer the interval between the crack and the thump. The time between the crack and thump at the following ranges is:

a. 300 metres — 2/3 of a second;

b. 600 metres — 1 1/3 seconds; and

c. 900 metres — 2 seconds.

25. Judging the distance to an automatic weapon is slightly more difficult. The last crack and the last thump must be picked out in order to establish the correct automatic weapon range. If the distance is great and the bursts are short, all the cracks of one burst will be heard, followed by the thumps.

CHAPTER 3
ENGAGING THE TARGETS

SECTION 1
JUDGING DISTANCE

GENERAL

1. It is important that an observer be able to judge distances accurately for the following reasons:

a. to set weapon sights accurately;

b. to report enemy locations accurately;

c. to prepare range cards; and

d. to call for supporting fire.

UNIT OF MEASURE METHOD

2. A known accurate distance is visualized (e.g., a football field or the distance between two telephone poles), and that unit is applied repeatedly between the observer and the target until the range is determined.

3. This system of judging distance requires practice and a good knowledge of the ground. Observers must be able to see all the ground between themselves and the target, otherwise there would be nothing to which they could relate the unit of measure. This method is not accurate beyond 400 metres because it is too difficult to relate increments beyond that distance.

APPEARANCE METHOD

4. When there are hills, woods or other obstacles between the observer and the target that conceal most of the ground from observation, it is impractical to apply the unit of measure. The

appearance method compares the way an object looks at 100 metres and at greater distances. By comparing the appearance of a man in several positions—at 100, 200, 300, 400 and 500 metres--observers can establish a series of mental pictures. They will find that, as distances increase, a man's figure becomes smaller, his outline becomes increasingly blurred and his other features gradually fade out. The following may be used as a rough guide to determine the distance a soldier is from the observer:

a. 200 metres—all parts of the body are distinct;

b. 300 metres—outline of the face becomes blurred;

c. 400 metres—outline of the body remains, but the face is difficult to distinguish;

d. 500 metres—the body appears to taper from the shoulders; movement of the limbs can be observed; and

e. 600 metres—the head appears as a dot with body details invisible and tapering noticeably.

5. In the same way, the appearance of other familiar objects can be learned.

CONDITIONS THAT AFFECT ESTIMATION OF RANGES

6. Objects can seem nearer than they really are:

a. when the object is in bright light or the sun is shining from behind the observer;

b. when the colour of the object contrasts sharply with the colour of the background;

c. when the observer is looking over water, snow or a uniform surface;

d. in the clear atmosphere of high altitudes;

e. when there is dead ground between the target and the observer: and

f. when they are larger than other things around them.

7. Objects can seem more distant than they really are when:

a. the observer is looking over a depression, all of which is visible;

b. there is poor light or fog or the sun is in the observer's eyes;

c. only a small part of the object can be seen;

d. looking down a street or tree-lined road;

e. the object tends to blend in with the background;

f. objects are smaller than other things around them; and

g. the observer is lying down.

OTHER METHODS OF DETERMINING RANGE

8. Ranges may be determined by other methods such as:

a. measuring from a map or an air photograph;

b. pacing the distance;

c. firing a machine-gun (ranging);

d. using the mil formula;

e. looking at range cards; and

f. using range-finders.

AIDS TO JUDGING DISTANCE

9. There are four basic aids to judging distance:

a. **Halving**. A point is chosen halfway to the target and the distance is estimated to the point and doubled;

b. **Bracketing**. If the target is known to be located between two reference points of known distance then the bracketing method may be used. Simply add the two known distances (X and Y) and then halve the sum for a close approximation of the range. For example, if X is 1000 metres and Y is 600 metres, the sum is 1600 metres, halved is 800 metres, which is the range. The further away the target, the larger the bracket should be;

c. **Key Ranges**. If the range to any point in the arc is known, the distance to other objects from it can be estimated; and

d. **Unit Average**. Several personnel judge a distance and an average is made of their estimates.

SECTION 2
TARGET INDICATION

BASIC INDICATION

10. Firing a tracer round is a simple and accurate method of indicating a target. A disadvantage of this method is that it may disclose your location.

ARCS OF FIRE

11. It is easier to recognize a target if its surrounding area is known. An arc of fire is the sector of ground within which targets are engaged. It is defined by two imaginary lines from the weapon

position through two easily identified points on the landscape, which will be used to indicate right and left limits of the arc.

12. Detailing an arc of fire. The following is an example of this method (using Figure 3-1):

a. LOOK TO YOUR FRONT.

b. 600 m REFERENCE CHURCH, THREE-QUARTERS RIGHT, BEND IN ROAD.

c. RIGHT EDGE, RIGHT OF ARC.

d. 600 m REFERENCE CHURCH, THREE-QUARTERS LEFT, TWO TALL TREES, LEFT TREE, LEFT OF ARC.

e. NEAR LIMIT, ROAD RUNNING ACROSS OUR FRONT.

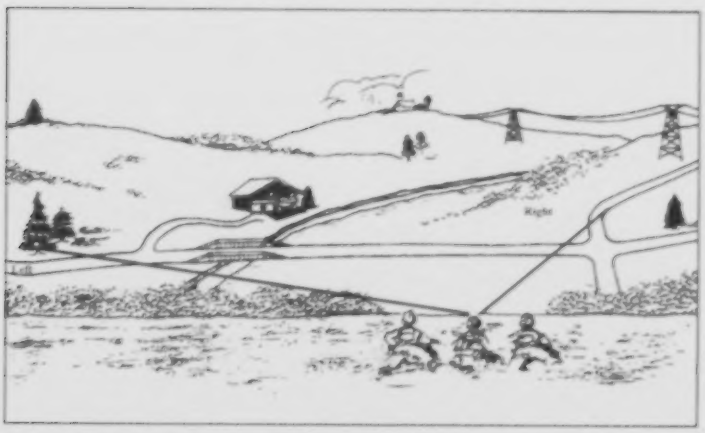

Figure 3-1: Detailing Arc of Fire

13. **Direct Indication**. Obvious targets are indicated verbally by the direct method. The person indicating gives the range, tells where to look and describes the target. The terms to be used are:

a. CENTRE OF ARC—for targets on, or very near, the centre;

b. LEFT or RIGHT—for targets at right or left angles to the centre of arc; and

c. SLIGHTLY, QUARTER, HALF or THREE-QUARTERS, and LEFT or RIGHT—for targets between the centre of the arc and left or right of the arc.

14. An example using Figure 3-2 is: TWO HUNDRED, HALF-LEFT--HOUSE.

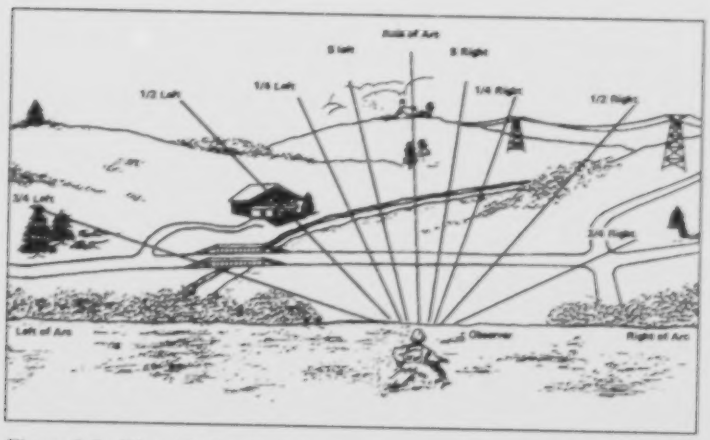

Figure 3-2: Direct Indication

REFERENCE POINTS

15. For targets that are difficult to identify, the direct method is used in conjunction with reference points and the ABOVE and BELOW method. Reference points should be prominent and unmistakable objects within the arc and should be selected in areas where targets may be expected to appear. To avoid confusion, as few reference points as possible should be used.

16. The direction of an indistinct target may be indicated by successive or auxiliary reference points.

17. A reference point of an arc of fire may be used as an aiming point or target.

18. Reference points are indicated as:

REFERENCE CENTRE OF ARC, CHURCH (KNOWN AS "CHURCH"), REFERENCE CHURCH, QUARTER RIGHT, TOWER, CENTRE OF ARC (KNOWN AS "FAR TOWER").

19. An example using Figure 3-3 is: REFERENCE CHURCH, QUARTER RIGHT, FAR TOWER (the target).

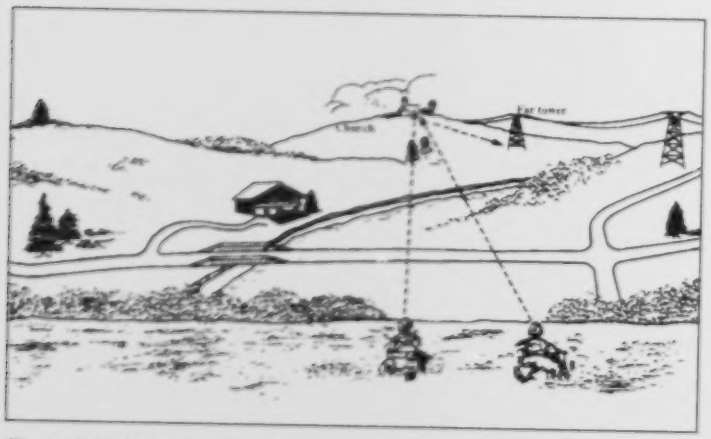

Figure 3-3: Reference Points

20. The range given is the range to the target.

CLOCK RAY

21. For targets that are difficult to indicate, a reference point and a clock face may be used. An elevated reference point works best. Using this method, the observer imagines a clock face standing up on the landscape with its centre on a precise point of the reference object

(see Figure 3-4). The observer gives the range to the target, whether the target is right or left of the reference point and the appropriate hour on the clock face to indicate the direction of the target from the reference point.

22. An example using Figure 3-4 is: THREE HUNDRED, REFERENCE CHURCH, FOUR O'CLOCK, TANK.

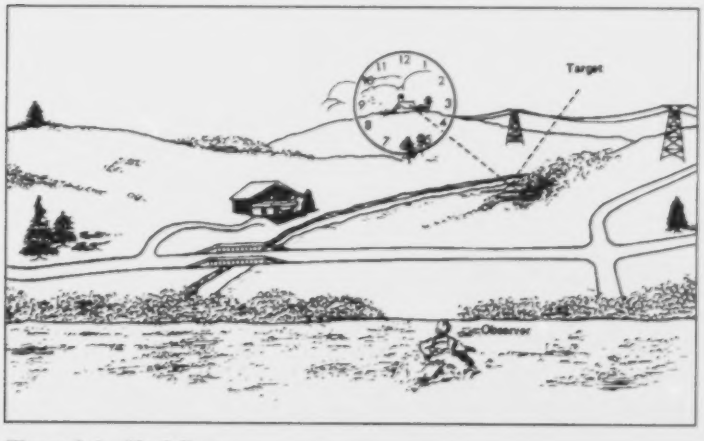

Figure 3-4: Clock Ray

AUXILIARY REFERENCE POINTS

23. Auxiliary reference points as close as possible to the target may be used for target indication. The following is an example using Figure 3-5:

> TWO FIFTY, REFERENCE HOUSE, TWO O'CLOCK, TWO TREES, RIGHT FIVE MILS, TANK. (Auxiliary reference point is TREES.)

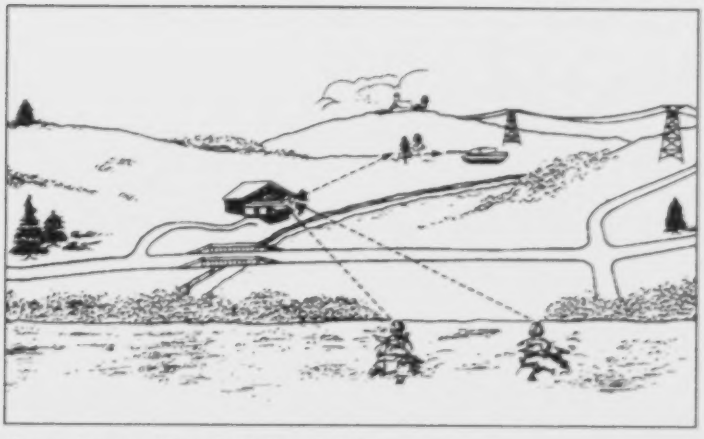

Figure 3-5: Auxiliary Reference Points

24. The lateral distance in mils from a reference point may help the observer to indicate an indistinct target.

25. **Successive Reference Points**. As a last resort, a series of successive reference points may be used. This method may be confusing. The following is an example using Figure 3-6: THREE HUNDRED, BRIDGE, RIGHT 2 O'CLOCK TWIN PINES, RIGHT 2 O'CLOCK FAR TOWER, 6 O'CLOCK, TANK.

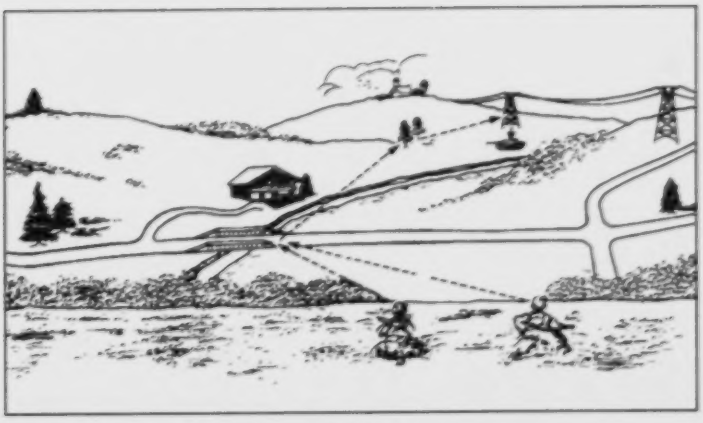

Figure 3-6: Successive Reference Points

26. The last target may be used as a reference point if it is near the new target.

27. The range given is always the range to the target. For example, in a section position, the section commander will give the range to the target from the centre of the position.

HAND SPAN METHOD

28. The method that will probably be used most frequently for making lateral measurements is known as the hand span method. A person's hand extended at arm's length can be used to measure angles. Section commanders and crew members who may be called upon to exercise fire control responsibilities must establish the subtention values for their own hands. The approximate angular values for an average man's hand are shown in Figure 3-7.

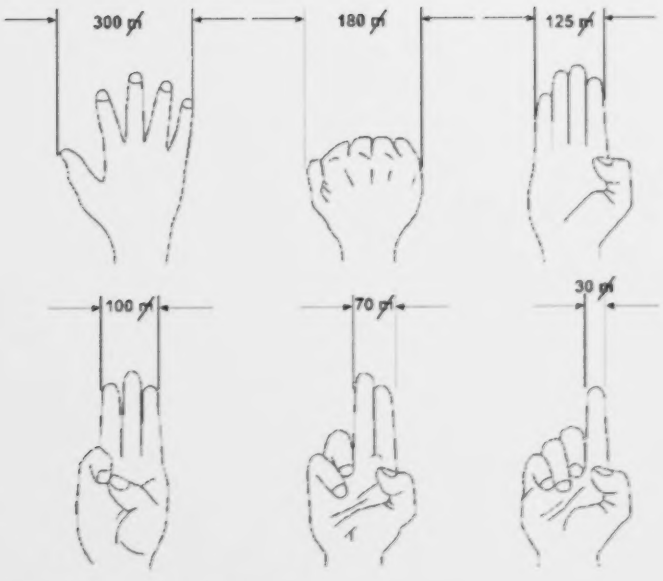

Figure 3-7: Hand Span Method

CHAPTER 4
INDIVIDUAL MOVEMENT

SECTION 1
METHODS OF INDIVIDUAL MOVEMENT

THE KITTEN CRAWL

1. The kitten crawl is simply crawling on hands and knees. It is useful behind cover about sixty centimetres high. If silence is required, a safe place without twigs must be chosen to place the hands. When the hands are moved, the knees should be placed exactly where the hands have been. The back and head must be kept low but observation must be maintained. The weapon is held at the point of balance (see Figure 4-1).

Figure 4-1: The Kitten Crawl

THE LEOPARD CRAWL

2. The leopard crawl is crawling on the elbows and the insides of the knees, alternating from one to the other, rolling the body a little as each knee is bent. It is useful behind very low cover. An

alternative method is to let one leg trail behind and use only one knee. The heels, head, body and elbows are kept down. Observation is continued during the move.

3. The weapon is held with the right or left hand on the pistol grip or small of the butt and the other hand at the forestock. Alternatively, grasp the weapon by the front of the sling with the right or left hand, with the rifle resting on the other, arm holding the weapon muzzle forward (see Figure 4-2).

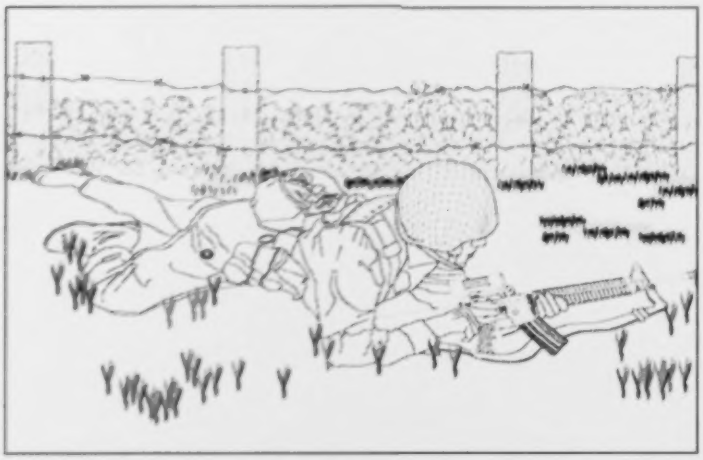

Figure 4-2: The Leopard Crawl

THE STOMACH CRAWL

4. This crawl is slow and tiring, and it should only be used when the utmost caution is necessary. It is particularly useful when the stalker is forced to use very low cover or crawl in the open. The whole body is pressed as close to the ground as possible. Movement is obtained by pulling with the forearms and at the same time pushing with the insides of the feet with the heels kept on the ground.

5. The rifle is held with the right or left hand on the pistol grip or small of the butt and the other hand at the forestock. Alternatively, grasp the weapon by the front of the sling with one hand, with the rifle resting on the arm holding the weapon, muzzle forward. Frequent pauses must be made for observation because it is difficult to look up while moving (see Figure 4-3).

Figure 4-3: The Stomach Crawl

THE MONKEY RUN

6. The monkey run is movement from a crouched position with a single hand on the ground. The soldier is in a position to either drop to the ground or break into a run or sprint.

THE ROLL

7. The roll is often the quickest way of getting away from a spot, such as a crest line. This method works only on level ground or downhill. The weapon and arms should be kept as close to the side as possible. It is difficult to control direction during the roll. After completing a roll, personnel may be confused as to the direction of the enemy and may feel dizzy.

THE WALK

8. The weapon must be held ready for instant use. The whole attitude of the soldier must be alert, head up and observing. To move quietly on hard ground, the edge of the sole of the boot should be placed down first. To maintain balance, the knees should be slightly bent (see Figure 4-4).

Figure 4-4: The Walk

THE RUN

9. The run is faster than the usual double. It is normally a zigzag movement but may be a dash. Bounds are short to maintain breath control.

TURNING

10. To turn to the right in the prone position, ease the body as far to the right as possible keeping the legs together. The left leg is then moved as far to the left as possible; the right leg is then joined to the left leg and the body moved still further to the right. These

movements are repeated until the body is facing the desired direction. Reverse the movement to turn to the left.

SECTION 2
INDIVIDUAL TACTICAL MOVEMENT

LOOKING THROUGH COVER

11. Look through cover, rather than around or over it. If cover must be looked over, do not break a straight line (fence lines, skylines, etc.). Choose background to match the clothing and camouflage worn (see Figure 4-5).

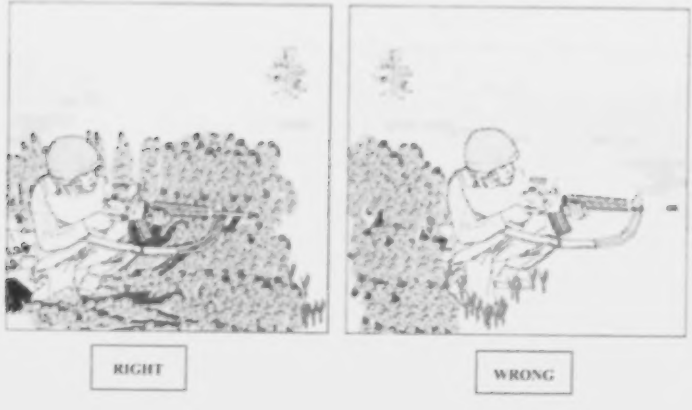

Figure 4-5: Looking through Cover

SHADOWS

12. Soldiers should keep in the shadows and remember that shadows move as the day progresses. When observing or firing from a window, soldiers must ensure they are far enough back from the window to be in the shadows (see Figure 4-6).

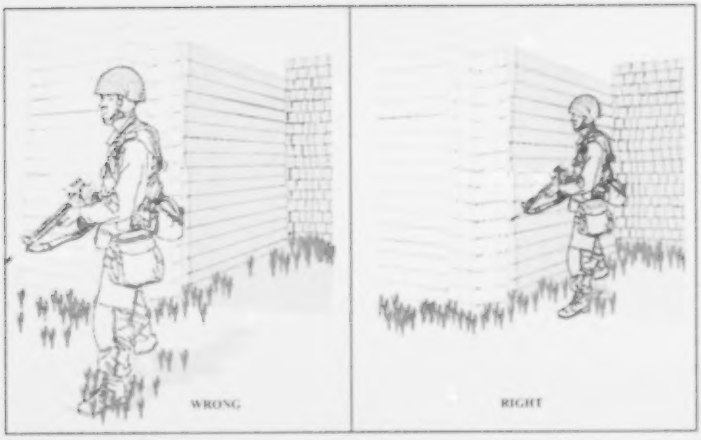

Figure 4-6: Use of Shadows

SKYLINES

13. Skylines should be avoided. If a skyline must be crossed, the soldier should move across slowly in the lowest possible position (see Figure 4-7).

ISOLATED COVER

14. Isolated cover should be avoided because it attracts the enemy's attention and effective speculative fire (see Figure 4-8).

Figure 4-7: Avoid Skylines

Figure 4-8: Avoid Isolated Cover

CHAPTER 5
USE OF GROUND

SECTION 1
COVER AND CONCEALMENT

COVER FROM FIRE

1. Cover from fire is protection from the effects of enemy weapons. Natural cover (e.g., ravines, hollows, reverse slopes) or artificial cover (e.g., walls, ditches, trenches) provides protection from flat trajectory fire and partial protection from high angle fire and the effects of nuclear explosions. Even the smallest depression or fold in the ground provides some cover.

COVER FROM VIEW

2. Cover from view is concealment from enemy observation. Cover may be natural or artificial. Concealment is not protection from enemy fire. Natural concealment (e.g., bushes, grass and shadows) is provided by surroundings and needs no change to be used. Artificial concealment is made from materials such as burlap or nets. It can also be made from natural materials, such as bushes, leaves and grass, which have been moved from their original location.

SECTION 2
LINES OF ADVANCE

BASIC CONSIDERATIONS

3. There are four basic considerations that are made in selecting a line of advance:

a. objective/destination;

b. time;

c. ground/boundaries; and

d. probable enemy position.

THE IDEAL

4. The ideal line of advance provides five advantages:

a. places from which to observe without being seen;

b. good firing positions;

c. movement free of enemy observation;

d. cover from enemy fire; and

e. freedom from obstacles to movement (e.g., open ground, swamps).

5. Movement is from one position of observation to another. Anticipated firing positions are selected. Flexibility is essential.

SECTION 3
OBSTACLE CROSSING

OBSTACLES

6. Obstacles should be crossed as quickly as possible with the least silhouette showing because they will usually be covered by enemy fire. The crossing of obstacles is practised to achieve required efficiency. A covering group is to be deployed, if possible, when obstacles are crossed.

WIRE

7. Beware of booby traps. Creep under wires, face up, if possible. It may be possible for one man to lie on the wire and flatten it, while others climb over his body. If wire must be cut, it should be held on both sides of the cut to avoid noise and injury from flying ends.

GATES AND WOODEN FENCES

8. There are different ways to cross gates and wooden fences (in order of priority):

a. to crawl under them;

b. to go through an opening that is either made or identified; or,

c. to go over as quickly and with as low a silhouette as possible.

WALLS

9. Teams are formed to assist each other up to the top of the wall. One then rolls across the top, keeping flat, and jumps down the other side.

DITCHES, STREAMS, HEDGES, GAPS

10. These obstacles are very likely to be covered by enemy fire and should be crossed as quickly as possible, preferably in groups, at irregular intervals.

OPEN AREAS

11. Open areas should be avoided except when absolutely necessary. One lies concealed on the near side and examines the area before crossing.

12. When going through tall grass, moving in a straight line causes the grass to wave in an unnatural motion. Without changing the final destination, the direction of movement should change (i.e., zigzag) from time to time in order to avoid compromising movement. The best time to move is when the wind is blowing the grass. One must, however, weigh both the enemy threat and time factor when confronted with such obstacles.

13. Isolated and conspicuous cover should be avoided, as it will attract the enemy's attention.

14. When crawling across plowed fields, furrows should be followed as much as possible. Cross furrows in a low part of the field.

ROADS AND TRAILS

15. Roads and trails should be crossed near a bend, or where the road is narrow, so that the enemy's observation is limited and the time of exposure is as short as possible.

SECTION 4
STALKING

DEFINITION

16. Stalking is the application of fieldcraft to locate, approach and kill an enemy.

PLANNING A STALK

17. A stalk is planned as follows:

a. The enemy is located and a bearing is shot, or taken, to his position.

b. The position from which the kill will be made (the objective) is chosen. The route to it should be selected taking into consideration the following:

(1) cover from fire, view and dead ground;

(2) bounds;

(3) obstacles;

(4) other enemy positions, known and probable;

(5) possible alternative routes, in case of need; and

(6) how to maintain direction.

CONDUCT OF THE STALK

18. The following considerations are important for success:

a. be alert, never relax;

b. conduct careful observation after each bound;

c. continually select possible firing positions;

d. avoid isolated and conspicuous cover;

e. take advantage of noises, e.g., aircraft, gunfire;

f. avoid disturbing animals and birds as it attracts attention; be especially wary of dogs in villages, towns, etc.;

g. take risks earlier rather than later; and

h. remember, if your shot is a miss, the mission is a failure.

CHAPTER 6
AVOIDING DETECTION

SECTION 1
INDIVIDUAL CAMOUFLAGE

INTRODUCTION

1. Effective concealment of the individual depends primarily on the choice and use of background. It is the controlling element in individual camouflage and governs every concealment measure. One's clothes must blend in with the predominant colour of the background. The tone and colour of the hands, neck and face, and the shape, surface and silhouette of the helmet and personnel equipment must not contrast with their background. The individual soldier practises blending in with the background by hiding in shadows and avoiding contrast between his silhouette and the background. The soldier avoids movement against static or stationary background, follows hidden routes and conceals spoil, tracks, equipment and installations. The soldier must be equally concerned with the ground and air observer and must constantly remember why things are seen.

2. Camouflage discipline is essential because surroundings change, shadows move and foliage wilts.

SKIN

3. Camouflage cream, mud, burnt cork or wood, or something similar, is used on the face (nose, tips of ears, forehead), neck and hands (see Figure 6-1). More is applied for night work.

HELMET

4. The outline of the helmet is one of the striking characteristics of a soldier's equipment. Its curved familiar shape can easily be identified by the enemy. One of the first steps for individual camouflage is disruption, both of the form of the helmet and the strong straight-lined shadow that it casts. The helmet should be covered by

the helmet cover to eliminate shine and its outline broken up by foliage attached to the cover.

Figure 6-1: Personal Camouflage

PERSONAL WEAPONS

5. Shiny surfaces may be covered by binding them with disruptive material. Care must be taken to ensure that one's sight is not obstructed and the function of the weapon is not impaired.

PERSONAL EQUIPMENT

6. Age and repeated cleaning may fade webbing and other equipment. When this happens, it must be darkened to reduce contrast. Pieces of camouflage netting, or similar materials, may be tied to the equipment to disrupt the shape and mask any fading.

CHAPTER 7
NIGHT OR REDUCED VISIBILITY OPERATIONS

SECTION 1
INTRODUCTION

INFLUENCE OF NIGHT VISION AIDS

1. The advent of effective night fighting equipment has changed the nature of fighting:

a. more fighting is done at night;

b. complete surprise is rarely achieved;

c. night must now be treated as day, thus limiting the effectiveness of enemy surveillance equipment;

d. patrolling is done extensively, both day and night; and

e. only a high degree of training, skill and battlecraft will ensure a successful night operation.

TRAINING

2. Sporadic night training, lasting only a few hours, is of little value. Training periods should be long enough to overcome the initial unfamiliarity of working at night. Sections should have complete periods of training when they alter their normal routine and change to working at night and sleeping by day. This altered routine should be followed by night exercises of every type, which will give added confidence and foster self-reliance.

3. If a section can carry out night training continuously for a period of six to seven consecutive nights, far more will be achieved than during a number of four-hour exercises.

NIGHT VISION

4. The eye has two sets of light sensitive cells that are used for seeing: one set by day (cones) are in the center of the eye, and the other set by night (rods) are placed around the day cells.

5. The cones (day cells) need strong light to allow one to see. They work in moonlight, but under lesser conditions of light they are useless. The rods (night cells) are very sensitive to light and work when the day cells can no longer see. The changeover from the employment of cones to rods, known as night adaptation, is a slow process that takes approximately 35 minutes to complete. An alternative to sitting in darkness and waiting 35 minutes is to remain under red light for the same period of time. This will produce almost complete adaptation and allows work to be done during the waiting period. Constant training and practice improves night vision.

6. The night cells are weak and tire quickly. The ability to see at night is affected by colds, headaches, sleepiness or physical fatigue. Once adaptation has taken place, it is not possible to stare at an object for longer than four or five seconds without vision becoming blurred. The angle of sight should be changed often to allow the cells to perform effectively.

OFF-CENTRE VISION

7. As mentioned previously, the cones are in the centre of the eye. At night, if one looks directly at an object, one will see very little because these cells cannot work in poor light. To see at night, one must use the rods, which are around the cones. This means looking at an angle (about 100 to 170 mils) away from the object. This is called off-centre vision.

8. Once an object has been identified using off-centre vision, it is possible to look directly at it for a few seconds before its image disappears. This is a useful aid to shooting at night.

9. When observing at night, it is possible to scan the ground using the method described in Chapter 2. In order to study an object or a piece of ground in greater detail, it is better to scan using a "figure

eight" technique, which makes full use of off-centre vision (see Figure 7-1).

FIGURE EIGHT METHOD OF EYE MOVEMENT TO SEARCH GROUND

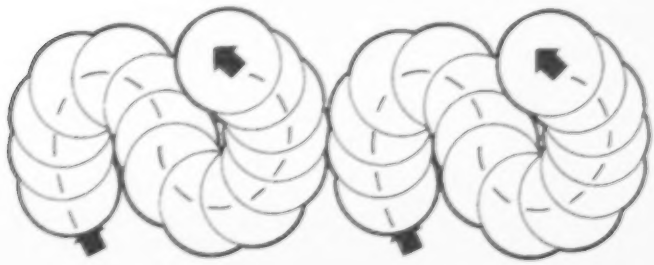

Figure 7-1: Night Scanning

10. When observing at night, the following should be kept in mind:

a. all objects are seen by silhouette, so the observer must be close to the ground to obtain a skyline;

b. no detail or colour can be seen; and

c. judging distance is difficult.

PROTECTION

11. Bright lights spoil night adaptation. A match flame or a muzzle flash spoils night adaptation for several seconds. An illuminating flare ruins night vision. It must become an instinctive reaction to cover one eye when faced with any light at night. If it is necessary to observe in the area of a light, one should look off to the side.

STARING

12. If any single point of light or a prominent object is stared at for too long, it will seem to move. This is the reason why sentries imagine that they see trees moving at night and fire their weapons without apparent reason. "Placing" the object against something else, such as a finger at arm's length, can prevent this.

SECTION 2
NIGHT VISION AIDS

OPTICAL WEAPON SIGHTS

13. The optical rifle sight has a light gathering capability and is useful for observation at night. It is particularly useful at dusk and in early morning light. It is more effective for observing at a distance. One should not constantly stare through the sight as constant use strains the eye. The sight should be used to investigate suspicious areas and to scan regularly.

BINOCULARS

14. Binoculars have some light gathering capability depending on objective lens diameter and magnification. A diopter scale, marked on each eyepiece, is used to measure the degree of focus. To determine the best focus during daylight, close each eye in turn and adjust each eyepiece for best focus while observing a distant object. Note the reading on each eyepiece. For night use, set each gradation for one less than daylight use.

IMAGE INTENSIFICATION DEVICES

15. An image intensification device is a passive device that electronically enhances the light image. The image appears in shades of green and black. Individual weapon sights have detection ranges of up to 600 metres on a clear starlit night, while crew-served devices have a greater range with twice the magnification capability. Inclement weather and smoke can adversely affect performance.

THERMAL IMAGERY DEVICES

16. A thermal imagery device is a passive device that uses a phosphorescent tube to display a thermal image. The device detects the difference in temperature between material or personnel and other objects in the immediate area. Objects with a marked temperature difference, such as hot metal, weapons and vehicles (including exhaust gases), appear brightly on the display tube as black or white signatures in contrast to the cooler surroundings. The device has a limited penetration capability through light foliage. Thermal imagery devices are less affected by inclement weather than either the eye or image intensification devices.

SECTION 3
NIGHT SOUNDS

GENERAL

17. Sounds can be heard better at night because there are fewer noises to interfere and cooler, damper night air carries sound better. Practice improves the ability to hear and identify sounds.

OPTIMUM HEARING

18. To hear better at night, the soldier must keep quite still, lean forward a bit, half open his mouth and turn one ear towards any sound.

SECTION 4
NIGHT MOVEMENT

GENERAL

19. Because people hear more than they see at night, silence is vital. To move silently at night, it is necessary to go slowly.

20. A night patrol must not only be silent, it must stop often to look and listen. Patrols should halt in cover or shadow, if there is any. If not, lie down so there is less likelihood of being silhouetted against

the sky. On the other hand, things will be silhouetted to observers and they will hear better with their ears near the ground or on it. If a suspicious noise is heard while a patrol is moving, it is best to freeze for a moment, look and listen, and then slowly and silently take cover or lie down.

THE GHOST WALK

21. One's legs should be lifted high, to avoid long grass, and swept outward. The toes should be used to feel gently for a safe spot to place the foot. One foot must be secure before the other is moved. The knees should be slightly bent and the weapon carried in one hand. The empty hand feels in front of the body, in the area between the knees and top of the head, for brush, wire or obstructions that will impede movement or make noise.

22. The soldier should not bend over because that position is tiring and restricts observation. The head should be kept up to improve observation.

THE KITTEN CRAWL

23. The kitten crawl is carried out by crawling on hands and knees. The ground ahead should be searched for twigs with the right hand and the weapon should be held in the left hand. When the area has been cleared or found free of noise-making debris, the knees are moved up to the right hand and the process is repeated.

THE STOMACH CRAWL

24. The stomach crawl is a very quiet means of closing with the enemy. It is slow and tiring and needs a lot of practice. One should lie on the stomach, search the ground ahead for twigs, dry leaves and trip wires with the right hand. Lift the body on the forearms and toes, press the body forward, and lower it to the ground. The weapon should be moved with the left hand.

ACTION ON FLARES

25. In open country, if there is little cover, it is best to take cover or lie down the instant the light is seen.

26. In close country, such as in areas of small trees and tall brush where there is a lot of cover, it is better to stop all movement and freeze in place. The enemy is likely to be nearer in close country and the noise will attract his attention if one takes cover. The background in close country prevents silhouetting.

27. Trip (ground) flares are usually placed in areas under observation by the enemy. If caught in the light of a ground flare, one should move quickly out of the lighted area.

CHAPTER 8
MOUNTED OPERATIONS

SECTION 1
CAMOUFLAGING VEHICLES

GENERAL

1. A poorly concealed vehicle can lead to the complete destruction of a position. The section is responsible for camouflaging the vehicle, either on the position or in a hide. The driver, who stays behind for hide/harbour security, completes the final details.

SITING

2. If possible, vehicles should occupy terrain without altering its appearance. Vehicles should be parked under natural cover. When cover is inadequate, they should be parked so that the shape of the vehicle disappears into the surroundings.

NATURAL MATERIALS

3. When cut foliage is used to alter the shape or texture of a vehicle, it must be replaced as soon as it starts to wither. Cut foliage should be arranged on the equipment so that it blends into the surroundings.

NETS

4. Nets are infrared (IR) reflective, provide thermal masking and give complete concealment against direct observation. However, frequently they can be identified as nets. To ensure maximum effectiveness, care must be taken to suspend, drape and camouflage the net so that it is approximately 45 centimetres away from the sides of the vehicle.

TRACKS

5. Tracks are especially revealing to the air observer. They indicate type, location, strength and even intentions of a unit. Tracks should follow closely and be parallel to hedges, fences, cultivated fields and other natural terrain lines in order to remain inconspicuous from the air. Tracks should always continue past a position as part of a strictly enforced track plan.

6. Short lengths of tracks may be obliterated by brushing or covering with natural material. When tracks cannot be concealed, it may be necessary to make tracks in other areas to confuse and mislead enemy observers.

SHINE

7. Shine is caused by light reflecting off windshields, headlights and cab windows. Even under heavy overhead cover, shiny objects may be revealed through small gaps. A shiny surface must be covered to prevent reflection. Hessian, rolled down over windows, mirrors and lights, helps to prevent shine.

SHADOWS

8. Vehicles may be concealed within the shadow cast by large objects. Care must be taken that the distinctive shadow of a vehicle is hidden or disrupted.

DIGGING IN

9. When the situation permits, every effort must be made to dig in vehicles. Not only are they more easily concealed, but they are also protected from fragments. The excavation is made with a slanting approach and the vehicle is parked in the pit. Sandbags are used to form a revetment for protection and the whole thing is covered with a net. The net is sloped gently out to the sides and staked down. Finally, the vehicle tracks to the position are bushed out or covered. An excavation vehicle will make a difference in the time required to dig in vehicles, trenches and other support vehicles and equipment.

Consequently, defensive positions will take a lot less time to prepare. However, final details of camouflaging the position will always be by personal touch.

ANNEX A

LIST OF REFERENCES

1. The following publications are related to, and may be used in conjunction with, this manual.

a. B-GL-318-009/PT-001, *Military Training, Volume 9, Camouflage and Concealment*;

b. *Pilkington Optronics User Handbook UH 149 for "Kite" Common Weaponsight*;

c. *Pilkington Optronics User Handbook UH 178 for Image Intensified Weaponsight "Maxikite"*.